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NIOSH > Workplace Safety and Health Topics
> Fatality Assessment and Control Evaluation(FACE) Program > State FACE Reports



New Hampshire Construction Project Manager Dies When Crushed by Five Ton Concrete Slab on Massachusetts Construction Site

Massachusetts FACE 94-MA-067-01

SUMMARY

On October 21, 1994, a 46 year old New Hampshire construction project manager died from injuries received when he was crushed by a five ton concrete slab on a Massachusetts construction site. Working in an excavation at the time of the incident, the victim and his crew were attempting to cap the end of a 10,000 gallon commercial septic tank. The crane lowered the five ton cap into the excavation. The men were positioning it into place when two steel re-bar eyelets, embedded in the concrete slab to which the crane's wire rope was affixed, broke. The victim suffered the full force of the slab upon the back of his body as he attempted to scale the excavation wall. Emergency medical services were summoned while the crew removed the slab from the victim. The victim was removed from the excavation, and pronounced dead on the scene by a Life Flight physician approximately thirty minutes following the incident.

The MA FACE Field Investigator concluded that to prevent similar future occurrences, manufacturers of pre-cast concrete products should:

- **install lifting inserts in their products that are suitable for use at the time of installation.**

In addition, employers should:

- **ensure that load lifting anchor points and rigging accessories are capable of carrying the intended load**
- **design, develop and implement a comprehensive safety program for all employees that includes, but is not limited to, safety training and hazard recognition for septic tank construction and, particularly, rigging operations**

INTRODUCTION

On October 21, 1994, a municipal police department dispatcher notified the MA FACE Program of the crushing death of a 46 year old construction project manager earlier in the day. An investigation was immediately initiated.

On October 27, 1994, the MA FACE Field Investigator travelled to the incident scene and interviewed employer representatives. The police report, death certificate, multiple photographs and news clippings were obtained during the course of the investigation.

The employer was a sitework and sheet piling construction company in business for seven years and three months at the time of the incident. The company employed approximately fifty-eight employees in various clerical and construction related occupations, five of whom had the same title designation as the victim.

The company employed a designated safety person who devoted approximately 26-50% of his time to safety related matters. While there was no formal company safety and health committee at the time of the incident, there were general comprehensive written safety rules and procedures in place. None however, addressed the tasks being performed by the crew at the time of the incident.

The victim was a 46 year old, male project manager who was employed by the company approximately three years and six months at the time of his death.

INVESTIGATION

On October 21, 1994, a sitework and sheet piling crew was nearing completion on the installation of a 10,000 gallon septic tank at a Massachusetts grammar school construction site. The company had been on the site approximately four and one-half months and had successfully installed five other septic systems on the construction site without incident.

The final installation was comprised of a five section, 10,000 gallon capacity septic tank, capped at each end with a fitted concrete slab. Each section of the septic tank and one end cap had successfully been lowered into the site excavation by crane and set into place by the crew prior to the incident. The installed end cap weighed approximately 2 tons and was approximately 4 inches thick. The end cap in the incident weighed approximately 5 tons and was approximately 10 inches thick.

The victim and two other crew members were situated in the excavation as the crane was lowering the five ton end cap into the excavation to be placed and bolted to the tank opening. According to one of the co-workers, who remained to one side of the open ended septic tank, the victim and another co-worker were guiding the end cap into place. Lying on the ground behind these two men were two lengths of PVC drainage pipe. The witness further described that as the slab was nearing the excavation floor, a loud snap was heard and the slab began to topple.

Immediately yelling for everybody to get out of the way, the witness watched from within the side of the excavation as the men momentarily attempted with all their strength to keep the slab upright. Realizing they could not do so, they fled. The co-worker was able to scramble out between the drainage pipes onto which the slab momentarily rested. The victim however, suffered the full force of the concrete slab upon the back of his body as he attempted to scale the excavation wall. Emergency medical services were summoned while the crew removed the slab from the victim. The victim was removed from the

excavation, and pronounced dead on the scene by a Life Flight physician approximately thirty minutes following the incident. The co-worker was subsequently treated for minor abrasions and shock.

The investigation revealed that at the time of manufacture, the concrete end cap was apparently poured in a flat, horizontal manner and cured with four, one inch steel eyelets in place. The eyelets were made of bent re-bar. They were apparently intended primarily to aid the manufacturer when lifting the cured slabs onto trucks for transport to jobsites or when utilizing the cap as a top mounting cover rather than an end mounting cover.

At the jobsite, two of these eyelets were utilized to suspend the load almost vertically by wire rope from the crane and lower the slab into the excavation. It was these two eyelets which snapped under the weight of the load causing the incident to occur.

CAUSE OF DEATH

The medical examiner listed the cause of death as multiple injuries.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Manufacturers of pre-cast concrete products should install lifting inserts in their products that are suitable for use at the time of installation.

Discussion: In this case, the re-bar eyelets embedded in the concrete cap were not strong enough to lift the material in the manner required at installation. These eyelets should have been removed before shipment to the contractor. Properly constructed lifting inserts should have been provided and located such that the load could be lifted vertically. These inserts should also be labelled with their load carrying capability so that appropriate rigging equipment may be chosen.

Recommendation #2: Employers should ensure that load lifting anchor points and rigging accessories are capable of carrying the intended load.

Discussion: During the course of the investigation, the question was raised as to how anyone would know that the steel rebar eyelets were not strong enough to carry the intended load. It was simply assumed that they came from the manufacturer capable of carrying the weight. Employers should ensure positively that eyelets or other lifting accessories embedded in the material have been correctly constructed, sufficiently anchored and strong enough to carry at least twice the intended load.

Recommendation #3: Employers should design, develop and implement a comprehensive safety program for all employees that includes, but is not limited to, safety training and hazard recognition for septic tank construction and, particularly, rigging operations

Discussion: Heavy materials should be rigged by personnel who are trained to do so. It is only through training that workers can recognize the appropriateness of inserts, hooks, slings and other hoisting materials for a particular lift. All personnel on the site should be made aware of how a load may behave under different circumstances by discussing lifts of heavy materials beforehand. This training should also emphasize the workers' inability to prevent heavy materials from falling and that escape is the only appropriate response to a failing lift. In this case, the victim wasted precious seconds attempting to stabilize the material when he should have escaped.

REFERENCES

29 CFR 1926 Subpart Q Concrete and Masonry Construction and Subpart N Cranes, Derricks, Hoists, Elevators and Conveyors

U. S. Department of Energy, Hoisting and Rigging Manual, Washington, DC, April 1993, DOE/ID-10500

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[Back to Massachusetts FACE reports \(http://wwwn.cdc.gov/NIOSH-FACE/Default.cshtml?Category=0000&Category2=ALL&State=MA&Submit=Submit\)](http://wwwn.cdc.gov/NIOSH-FACE/Default.cshtml?Category=0000&Category2=ALL&State=MA&Submit=Submit)

[Back to NIOSH FACE Web](#)

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